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Reply to: 3460 January 12, 1989

Subject: American beech mortality within the Daniels Creek Opportunity Area

To: District Ranger, Greenbrier Ranger District

We were requested to provide information on the current impact of beech bark disease on the American beech resource within the Daniels Creek Opportunity Area (OA). Aerial photography was used to rate the amount of hardwood mortality in stands with a component of American beech.

Methods: A database was constructed at the Morgantown Field Office which listed all stands within Greenbrier Ranger District with an American beech component. The Daniels Creek OA has American beech located only in compartment 44. The amount of mortality was rated from aerial photography for only those stands which had at least ten square feet per acre of American beech.

High altitude panoramic aerial (1:30,000 scale) color infrared photography was acquired on June 11, 1988. The procedure for aerial photograph interpretation followed Mielke et al. (1984) and Acciavatti and Dropp (1986). Each stand was rated (see Table 1) according to the methods developed by Acciavatti and Dropp (1986).

No ground data was taken to determine the accuracy of the aerial photography interpretation, but good results were achieved within the Gaudineer OA. The Gaudineer OA and the Daniels Creek OA were examined at about the same time by one aerial photograph interpreter. Therefore, the results for the Daniels Creek OA should be as accurate as the Gaudineer OA.

Results and Discussion: Our VIMIS data listed American beech was present within 42 stands (1740 acres) of the Daniels Creek OA. Nineteen stands (636 acres) had at least ten square feet of American beech per acre. One stand had no mortality observed using the aerial photographs. Table 2 lists the mortality rating for each of the remaining 18 stands. Figure 1 shows the distribution of stands classified with light, moderate, and severe mortality. The Daniels Creek OA should be classified in the killing front because heavy beech scale populations are known to occur within seven miles of the OA, and severe mortality has begun in some stands (see Figure 1 and Table 2) (Houston and O'Brien, 1983). Mortality of the American beech will continue over the next ten years.

Recommendations: Beech bark disease mortality will continue to increase within the Daniels Creek OA. The economic impact on the timber resource by

the disease will probably not be significant. Beech bark disease may have an impact on certain wildlife species (such as grouse, turkey, bear and deer) which may depend upon the mast crop. Also, if American beech sprouts from susceptible parents are not removed, then a potential exits in the future to increase the problem caused by this disease (Houston, 1975). The following recommendations (Mielke et al., 1986) should be applied to as many stands as possible:

1. Salvage dead, declining (thin crowned, chlorotic) trees, especially hazard trees.

2. Monitor insect and disease condition.

3. Salvage trees with heavy scale populations and trees with signs of Nectria spp.

4. Treat infested understory or sprouts associated with heavily infested overstory.

5. Leave trees and their root sprouts with little or no scale and no signs of Nectria spp.

Permanent Plots: No beech bark disease permanent plots or red spruce Trend/ Symptomatology plots are located within the Daniels Creek OA.

Please contact me (304-291-4133) if you have any questions, or need further assistance.

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Literature Cited

Acciavatti, Robert E. and Elizabeth R. Dropp. 1986. Beech Bark Disease Damage Evaluations, Bradford Ranger District, Allegheny National Forest, Pennsylvania. Biological Evaluation 3440. USDA Forest Service, Forest Pest Management. 50pp.

Houston, David R. 1975. Beech Bark Disease: The Aftermath Forests Are Structured for a New Outbreak. Journal of Forestry. 73(10): 660-663.

Houston, David R. and James T. O'Brien. 1983. Beech Bark Disease. USDA Forest Service, Forest and Disease Leaflet 75, 8 pp.

Mielke, M. E., W. M. Ciesla, and R. J. Myhre. 1984. Inventory of beech bark disease mortality and decline on the Monongahela National Forest, West Virginia. USDA Forest Service, Forest Pest Management/Methods Application Group, Ft. Collins, CO. Rpt. No. 84-4, 15 pp.

Mielke, Manfred E., David R. Houston and Allan T. Bullard. 1986. Beech Bark Disease Management Alternatives. In: Proceedings Integrated Pest Management Symposium for Northern Forests; 1986 March 24-27; Madison, Wisconsin. pp 272 - 280.

Table 1. Decision criteria for beech bark disease damage classes*/.

BEECH BARK DISEASE DAMAGE INTENSITY CLASS	DESCRIPTION
Light	< 10% OF TREES DEAD AND DYING
Moderate	10 - 25% OF TREES DEAD AND DYING
Severe	> 25% OF TREES DEAD AND DYING

BEECH BARK DISEASE DAMAGE FREQUENCY CLASS	DESCRIPTION
Clustered	< 30% OF STAND AREA
Partial	30 - 60% OF STAND AREA
Widespread	> 60% OF STAND AREA

The damage class for each stand was labeled in Table 2 using the following coding matrix:

CODING MATRIX FOR BEECH BARK DISEASE DAMAGE CLASSES

INTENSITY CLASS	CLUSTERED	PARTIAL	WIDESPREAD
Light	LC	LP	LW
Moderate	MC	MP	MW
Severe	SC	SP	SW

*/ Taken from Acciavatti and Dropp (1986). The beech bark disease damage frequency class "Clustered" was originally referred to as "Scattered".

Table 2. Damage classes*/ for stands**/ with ten square feet per acre of American beech in compartment 44, Daniels Creek Opporutunity Area, Greenbrier Ranger District, Monongahela National Forest, 1988.

Damage Compartment	Stand	Acres	Total Stand Basal Area (sq. ft. / ac.)	Total American Beech Basal Area (sq. ft. / ac.)	Class
44	1	65	140	29	LP
	4	15	150	14	none
	5	32	140	42	LP
	6	7	160	15	LP
	7	12	130	18	MW
	9	29	150	12	MP
	10	31	150	10	MP
	13	21	130	15	LP
	14	6	160	12	LP
	15	14	150	21	LC
	24	22	150	10	LC
	27	69	150	10	LP
	28	94	150	14	LP
	30	45	200	12	MW
	32	46	160	10	MP
	33	30	110	26	SW
	40	25	140	16	MP
	44	44	140	14	SW
	45	29	150	16	MP

*/ See Table 1 for damage class codes.

**/ Stand acres and basal area estimates taken from VIMIS.

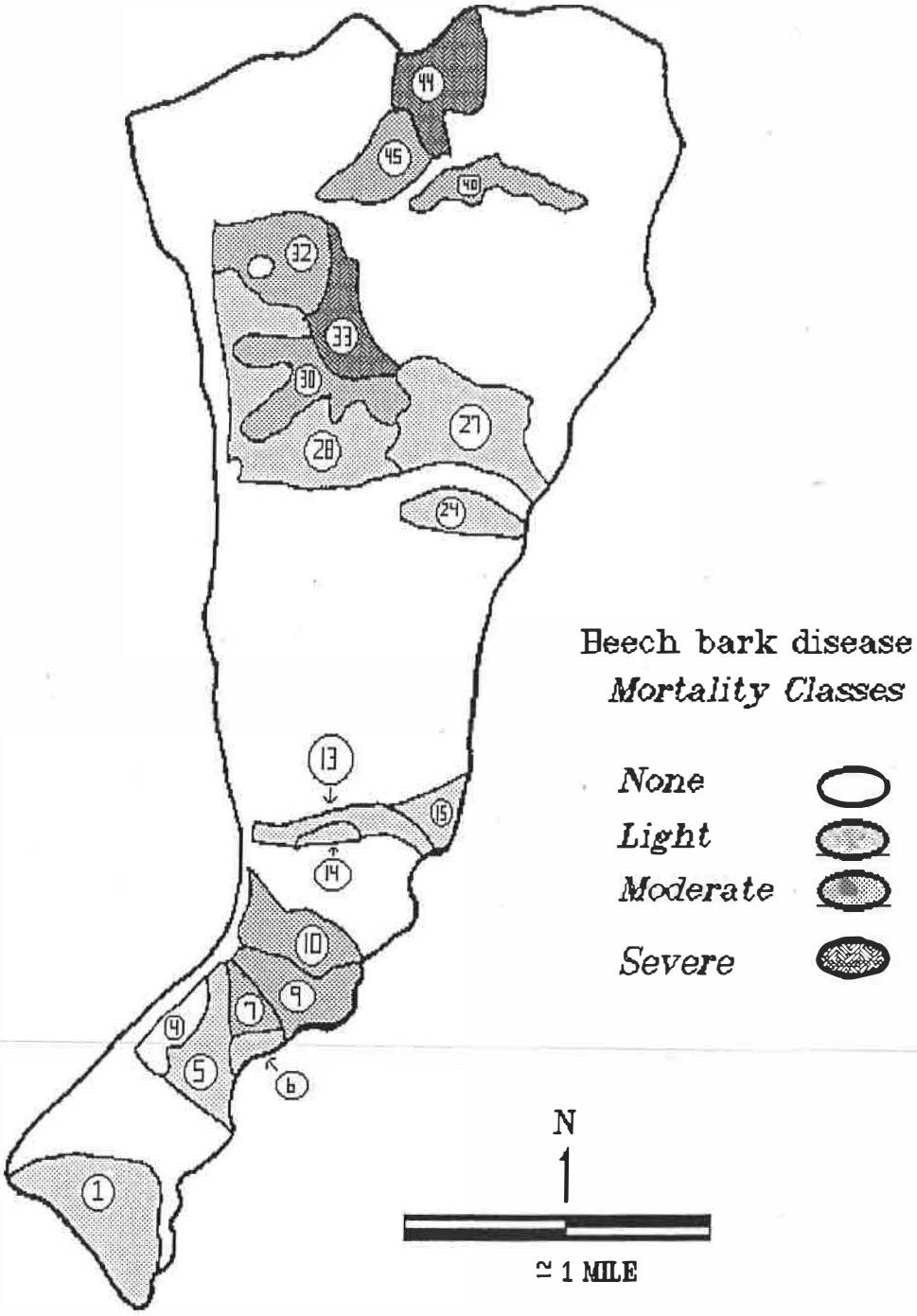

Figure 1. Stands with hardwood mortality in Compartment 44, Greenbrier Ranger District, 1988.